

WHAT IS CLAIMED IS:

1. A print system comprising:
a proxy server for converting a first print command written in a first language into a second print command written in a second language; and
at least one printer for receiving the second print command from the proxy server, interprets the received command, and performs a printing operation.
2. A printing method comprising steps of:
converting a first print command written in a first language into a second print command written in a second language; and
transferring the thus-converted second print command to a printer capable of interpreting the second language.
3. A proxy server comprising:
command conversion means for converting a first print command written in a first language into a second print command written in a second language; and
transfer means which can be connected to at least one printer and which transfers the second print command to the connected printer from the command conversion means.
4. A proxy server which can connect a host device capable of interpreting a first language to a printer capable of interpreting a second language, the server comprising:
conversion means which receives from the printer a first status message representing a printer status written in the second language and which converts the first status message into a second status message written in the first language; and
transfer means for transferring the second status message to the host device from the conversion means.
5. A printer comprising:
print means which performs a printing operation by interpretation of a first print command written in a first language;
conversion means which converts the first print command into a second print command written in a second language; and
transfer means which can connect the printer to at least one other printer capable of interpreting the second language and which transfers the second print command to the connected printer from the command conversion means.

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6. The printer according to Claim 5, wherein the command conversion means comprises rendering means for rendering a primitive raster image by interpretation of the first print command, and command preparation means for preparing the second print command by incorporation of the data, which include the raster image produced through rendering, into the format of the print command of the second language.

7. The printer according to Claim 5, further comprising means for selecting the second language from a plurality of predetermined languages.

8. The printer according to Claim 5, wherein further comprising selection means which can be connected to a plurality of other printers and selects from the printers a printer which is to perform a printing operation; and determination means for determining a language which the selected printer can interpret, wherein the first print command is converted into a print command of the thus-determined language, and the print command is sent to the selected printer.

9. The printer according to Claim 5, wherein the first language is a high-function language having superior image expression capability, and the second language is a low-function language having a low-function image expression capability.

10. The printer according to Claim 5, further comprising selection means for selectively activating the print means or the transfer means.

11. The printer according to Claim 10, wherein when a destination printer is specified by the first print command, the selection means activates the print means if the destination printer is the printer itself, whereas if the destination printer is the connected printer, the selection means activates the transfer means.

12. The printer according to Claim 10, wherein the printer is specifically designed to print a monochrome image, and wherein when the first print command specifies a print color and when the print color is a monochrome color, the selection means activates the print means, whereas when the print color is color, the selection means activates the transfer means.

13. A recording medium having recorded thereon a machine-readable computer program to be executed by a computer, the program comprising:

a process of converting a first print command written in a first language into a second print command written in a second language; and

a process of transferring the thus-converted second print command to a printer capable of interpreting the second language. -

14. A printer which can connect a first external device capable interpreting a first language to a second external device capable of interpreting a second language, the printer comprising at least one of

first conversion and transfer means for converting information, which is written in the first language and is received from the first external device, into information written in the second language and for transferring the information written in the second language to the second external device; and

second conversion and transfer means for converting information, which is received from the second external device and is written in the second language, into information written in the first language and for transferring the information written in the first language to the first external device.

15. A printer which can connect to a host device and another printer, the printer comprising:

a proxy server serving as proxy for another printer, in relation to the host device.

16. A local router comprising:

network communications means which can connect to a communications network and has a plurality of network addresses representing a plurality of locations on the network and which responds to a communications message addressed to any of the plurality of network addresses; and

data transfer means which can transfer the data included in a communications message addressed to any of the plurality of network addresses to a plurality of destinations and selects destinations of the data according to the network address of the communication message.

17. The local router as defined in Claim 16, wherein the local router can connect itself to one or more network-incompatible devices, and the selected network-incompatible devices are included in the destinations.

18. The local router as defined in Claim 17, wherein the devices are printers.

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19. The local router as defined in any one of Claims 16 through 18, wherein the network uses a TCP/IP protocol, and the network communications means has a plurality of IP addresses, a plurality of port numbers, or a plurality of identifiers as the plurality of network addresses and responds to a packet which is received from the network and includes any of the plurality of IP addresses, the port numbers, and the identifiers, and wherein the data transfer means selects a destination to which data included in the packet are transferred, according to the PI address, port number, or identifier of the packet including any of the plurality of IP addresses, the port numbers and the identifiers.

20. A local router relaying method comprising:

a step of responding to a communications message which is received from a communications network and is addressed to any one of a plurality of predetermined network addresses; and

a step of selecting the destination of data included in the communications message in response to the network address included in the communications message addressed to any one of the plurality of network addresses.

21. A network printer which can connect to a communications network, comprising:

network communications means which have a plurality of network addresses representing a plurality of locations on the network and which respond to a communications message received from the network and addressed to any one of the plurality of network addresses;

data transfer means which can transfer to a plurality of destinations the data included in the communications message addressed to any one of the plurality of network addresses and which determines whether to transfer the data to the destination according to the network address of the communications message;

print means which processes and prints the data as at least one destination of the plurality of destinations; and

connection means for connecting the printer to a network-incompatible device as at least one of the plurality of destinations.

22. The network printer as defined in Claim 21, wherein the device is another printer.

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23. A network printer which can connect to a communications network and is communicable with a host provided on the network, comprising:

relaying means which can connect to other devices, has all the network addresses assigned to a device group including the network printer and the devices, and relays communication between the host and the plurality of devices pertaining to the device group, in response to communication which is sent from the host.

24. A network printer which can connect to a communications network and is communicable to a host provided on the network, the printer comprising:

selection means which receives a print request from the host over the network, can process the received print request in various modes, and selects a mode in which the print request is processed according to the contents of the print request.

25. A computer-readable program recording medium having recorded thereon a computer program used when a computer executes a local router relaying method, the program comprising:

a step of responding to a communications message which is received from a communications network and is addressed to any one of a plurality of predetermined network addresses; and

a step of selecting the destination of data included in the communications message in response to the network address included in the communications message addressed to any one of the plurality of network addresses.

26. A computer-readable program recording medium having recorded thereon a computer program used when a computer implements a network printer which can connect to a communications network, the printer comprising:

network communications means which have a plurality of network addresses representing a plurality of locations on the network and which respond to a communications message received from the network and addressed to any one of the plurality of network addresses;

data transfer means which can transfer to a plurality of destinations the data included in the communications message addressed to any one of the plurality of network addresses and which determines whether to transfer the data to the destination according to the network address of the communications message;

print means which processes and prints the data as at least one destination of the plurality of destinations; and

connection means for connecting the printer to a network-incompatible device as at least one of the plurality of destinations.

27. A computer-readable program recording medium having recorded thereon a computer program used when a computer implements a network printer which can connect to a communications network and is communicable with a host provided on the network, the printer comprising:

relaying means which can connect to other devices, has all the network addresses assigned to a device group including the network printer and the devices, and relays communication between the host and the plurality of devices pertaining to the device group, in response to communication which is sent from the host.

28. A computer-readable program recording medium having recorded thereon a computer program used when a computer implements a network printer which can connect to a communications network and is communicable to a host provided on the network, the printer comprising:

selection means which receives a print request from the host over the network, can process the received print request in various modes, and selects a mode in which the print request is processed according to the contents of the print request.

29. A printer comprising:

host connection means for connecting to a host;

printer connection means for connecting to another printer; and

transfer means for transferring print job data received from the host to the connected printer.

30. The printer according to Claim 28, wherein the host connection means includes a network connection means which connects to the network and communicates with a host provided on the network.

31. The printer according to any one of Claims 29 and 30, further comprising performance examination means for examining the performance of the printer connected to the connection means.

32. The printer according to Claim 31, further comprising performance attribute notification means which reports to the host the performance of the connected

printer examined by the performance examination means and the performance of the printer.

33. The printer according to Claim 31, further comprising determination means which makes a determination whether to transfer a print job received from the host to the connected printer or to print the job by itself, on the basis of the performance of the connected printer examined by the performance examination means and the performance of the printer.

34. The printer according to Claim 31, further comprising selection means for selecting from a printer group including the connected printer and the printer itself one printer suitable for processing the print job data received from the host, on the basis of the performance of the connected printer examined by the performance examination means and the performance of the printer, wherein the transfer means transfers the print job data to the printer selected from the printer group.

35. The printer according to Claim 29, wherein the transfer means transfers the print job data to the specified printer from the host.

36. A printer option which can be optionally attached to a printer having host connection means for connecting to a host, the option comprising:

printer connection means for connecting to another printer; and
transfer means for transferring print job data received from the host to the connected printer.

37. The printer option according to Claim 36, further comprising network connection means which connects to a network and communicates with a host provided on the network.

38. The printer option according to any one of Claims 36 and 37, further comprising performance examination means which examines the performance of the connected printer and stores the result of such examination.

39. A printer manager comprising:
host connection means for connecting to a host;
printer connection means for connecting to a printer; and

transfer means for transferring print job data received from the host to the connected printer.

40. The printer manager according to Claim 39, wherein the host connection means includes network connection means which connects to the network and communicates with a host provided on the network.

41. The printer manager according to any one of Claims 39 and 40, further comprising performance examination means which examines the performance of the connected printer and stores the result of such examination.

42. A printer comprising:

upstream connection means for connecting to an upstream device which can be a host or another printer;

downstream connection means for connecting to a downstream device which can be yet another printer; and

transfer means which transfers print job data received from the upstream device to the downstream device.

43. The printer according to Claim 42, further comprising performance examination means for examining the performance of the downstream device.

44. The printer according to Claim 43, further comprising performance attribute notification means which reports to the upstream device the performance of the downstream printer examined by the performance examination means and the performance of the printer.

45. The printer according to Claim 44, further comprising determination means which makes a determination whether to transfer a print job received from the upstream device to the downstream device or to print the job by itself, on the basis of the performance of the downstream device examined by the performance examination means and the performance of the printer.

46. A printer operating method comprising:

a process of constituting a printer group by connecting another printer to a first printer;

a process in which the first printer receives print job data from a host; and

a process of transferring the received print job data to any one of the printer group from the first printer.

47. The printer operating method according to Claim 46, further comprising a process in which the first printer is connected to the host by way of a network.

48. The printer operating method according to any one of Claims 46 and 47, further comprising a process in which the first printer examines the performance of the connected printer.

49. A computer-readable recording medium having recorded thereon a computer program used when a computer provided in a printer which is connectable with another printer implements a printer operating method, the method comprising:
a process of receiving print job data from a host; and
a process transferring the received print job data to the connected printer.

50. The recording medium according to Claim 49, wherein the printer operating method further comprises a process of connecting the printer to the host by way of a network.

51. The recording medium according to any one of Claims 49 and 50, wherein the printer operating method further comprises a process of examining the performance of the connected printer.

52. A print system comprising:
a printer group formed by connecting other printers to a first printer; and
a host having a printer driver for use with the first printer, wherein the first printer comprises receiving means for receiving print job data from the host, and transfer means for transferring the received print job data to any one of the printers included in the printer group.

53. The print system according to Claim 52, wherein the first printer and the host further each comprise network connection means for connecting to a network.

54. The print system according to any one of Claims 52 and 53, wherein the first printer further comprises performance examination means for examining the performance of the connected printers.

55. A printer driver comprising:
means for issuing a performance attribute notification request to a printer;
means which receives the performance attribute notification request from the printer and which prepares a user interface screen according to the notified performance and displays the thus-prepared interface screen; and
means for transmitting to the printer data for which there is specified a value selected by the user on the user interface screen.

56. A computer-readable recording medium having recorded thereon a computer program used for operating a computer as a printer driver, the driver comprising:
means for issuing a performance attribute notification request to a printer;
means which receives the performance attribute notification request from the printer and which prepares a user interface screen according to the notified performance and displays the thus-prepared interface screen; and
means for transmitting to the printer data for which there is specified a value selected by the user on the user interface screen.

57. A printer comprising: *a*
composite document means for receiving or generating composite document data;
a plurality of renderers which correspond to a plurality of predetermined file formats, and which render, among resources included in the composite document data, resources whose file formats correspond to one another;
an image composer which prepares a final print image by integration of rendering results produced by the plurality of renderers; and
a print engine for printing the print image.

58. The printer according to Claim 57, further comprising a communications interface for connecting the printer to one or more devices in a communicable manner, wherein the composite document means is capable of receiving the decoded document data from any one of the devices by way of the communications interface.

59. The printer according to Claim 58, wherein the communications interface has means for connecting to a predetermined communications network.

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60. The printer according to any one of Claims 58 and 59, further comprising a document analyzer which identifies the file format of resources included in composite document data, wherein in a case where the composite document data include an incompatible file format which is not compatible with any of the renderers of the printer, the document analyzer transfers a resource of the incompatible file format to a device selected from the devices and requests the selected device to render the resource, and wherein upon receipt of a rendering result from the device, the document analyzer transfers the received rendering result to the image composer or the renderer of the printer.

61. The printer according to Claim 60, further comprising device information representing a file format capable of being rendered by the devices, wherein the document analyzer selects a device to which the resource of incompatible file format is to be transferred, by reference to the device information.

62. The printer according to Claim 61, further comprising means for preparing the device information.

63. The printer according to Claim 57, wherein in a case where the composite document data include an incompatible format which cannot be rendered by any of the renderers, the image composer prepares a final print image by handling the resource of incompatible format as a blank or by replacing the resource with a predetermined proxy image.

64. The printer according to Claim 57, wherein the plurality of renderers render solely a resource of a file format specified by the user among the resources included in the composite document data.

65. A printer comprising:
a communications interface which connects to one or more devices in a communicable manner;
composite document means for receiving or producing composite document data;
a document analyzer which identifies the file format of resources contained in the composite document data, transfers a resource of at least one file format to a selected device provided in another device, requests the selected device to render the thus-transferred resource, and receives a rendering result from the device;

an image composer for preparing a final print image from the result of such rendering, and
a print engine for printing the print image.

66. The printer according to Claim 65, wherein the communications interface has means for connecting to a predetermined communications network.

67. The printer according to any one of Claims 65 and 66, wherein the printer is provided with a renderer compatible with a predetermined file format, and wherein the document analyzer transfers to the renderer a resource of file format which is compatible with the renderer among the resources included in the composite document data and transfers to the selected device resources of file formats which are incompatible with the renderer.

68. The printer according to any one of Claims 65 and 66, further comprising device information representing a file format capable of being rendered by the devices, wherein the document analyzer selects a device to which the resource of incompatible file format is to be transferred, by reference to the device information.

69. The printer according to Claim 68, further comprising means for preparing the device information.

70. The printer according to any one of Claims 65 and 66, wherein in a case where the composite document data include an incompatible format which cannot be rendered by the printer or by any of the renderers, the image composer prepares a final print image by handling the resource of incompatible format as a blank or by replacing the resource with a predetermined proxy image.

71. The printer according to any one of Claims 65 and 66, wherein the document analyzer causes the printer or the device to render only a resource of file format specified by the user among the resources included in the composite document data.

72. A printer server comprising:
a communications interface which connects in a communicable manner to another device including one or more printers;

composite document means for receiving or generating composite document data;

means for selecting from the device a printer which is to print the composite document data; and

a document analyzer which identifies the file format of a resource contained in the composite document data and transfers to the thus-selected printer a resource of a file format capable of being rendered by the selected printer, and which supplies to the selected printer a rendering result regarding a resource of a file format incapable of being rendered by the selected printer.

73. The printer server according to Claim 72, wherein the communications interface has means for connecting to a predetermined communications network..

74. The printer server according to any one of Claims 72 and 73, wherein the document analyzer transfers to the device selected from the devices a resource of file format which cannot be rendered and requests the selected device to render the resource, and wherein upon receipt of a rendering result from the device, the document analyzer transfers the received rendering result to the selected printer.

75. The printer server according to any one of Claims 72 and 73, wherein the document analyzer transfers to the device selected from the devices a resource of file format which cannot be rendered and requests the selected device to render the resource and to transfer the result of rendering to the selected printer.

76. The printer server according to any one of Claims 72 and 73, wherein the printer server is provided with a renderer compatible with a predetermined file format, and wherein the document analyzer transfers to the renderer a resource of file format which is compatible with the renderer among the resources included in the composite document data and transfers to the selected device resources of file formats which are incompatible with the renderer.

77. The printer server according to any one of Claims 72 and 73, further comprising device information representing a file format capable of being rendered by the devices, wherein the document analyzer selects a device to which the resource of incompatible file format is to be transferred, by reference to the device information.

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78. The printer server according to Claim 77, further comprising means for preparing the device information.

79. The printer server according to any one of Claims 72 and 73, further comprising:

an image composer for preparing a final print image from the result of such rendering; and
a print engine for printing the print image.

80. A print system comprising:

a plurality of devices which are connected together in a communicable manner and which include one or more printers, wherein

at least one of the printers included in the devices includes
composite document means for receiving or producing composite document data;

a plurality of renderers which correspond to a plurality of predetermined file formats, and which render, among resources included in the composite document data, resources whose file formats correspond to one another;

an image composer for preparing a final print image by integration of a plurality of rendering results produced by the renderers; and
a print engine for printing the print image.

81. A print system comprising: *a*

a plurality of devices which are connected together in a communicable manner and which include one or more printers, wherein

at least one of the printers included in the devices includes
composite document means for receiving or producing composite document data;

a document analyzer which identifies the file format of resources contained in the composite document data, transfers a resource of at least one file format to a selected device provided in another device, requests the selected device to render the thus-transferred resource, and receives a rendering result from the device;

an image composer for preparing a final print image from the result of such rendering; and

a print engine for printing the print image.

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82. A print system comprising:
a plurality of devices which are connected together in a communicable manner
and which include one or more printers, wherein
at least one of the printers included in the devices includes
composite document means for receiving or generating composite
document data;
means for selecting from the device a printer which is to print the
composite document data; and
a document analyzer which identifies the file format of a resource
contained in the composite document data and transfers to the thus-selected printer a
resource of a file format capable of being rendered by the selected printer, and which
supplies to the selected printer a rendering result regarding a resource of a file format
incapable of being rendered by the selected printer.

83. A computer-readable recording medium having recorded thereon a
computer program for causing a computer provided in a printer to operate as
composite document means for receiving or generating composite document
data; and
a plurality of renderers which correspond to a plurality of predetermined file
formats, and which render, among resources included in the composite document data,
resources whose file formats correspond to one another.

84. A computer-readable recording medium having recorded thereon a
computer program for operating a computer, which is provided in a printer and can
communicate with one or more devices, as
composite document means for receiving or producing composite document data;
and
a document analyzer which identifies the file format of resources contained in
the composite document data, transfers a resource of at least one file format to a selected
device provided in another device, requests the selected device to render the thus-
transferred resource, and receives a rendering result from the device.

85. A computer-readable recording medium having recorded thereon a
computer program for operating a computer, which is provided in a printer and can
communicate with one or more devices, as
composite document means for receiving or generating composite document
data;

means for selecting from the device a printer which is to print the composite document data; and

a document analyzer which identifies the file format of a resource contained in the composite document data, and transfers to the thus-selected printer a resource of a file format capable of being rendered by the selected printer, and which supplies to the selected printer a rendering result regarding a resource of a file format incapable of being rendered by the selected printer.

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